

## PATENT

## PENDING CLAIMS AS AMENDED

Please amend the claims as follows:

1. (Currently Amended) An automatic gain control (AGC) apparatus operable during direct conversion of RF signals comprising:

an analog variable gain amplifier;

a digital variable gain amplifier coupled to an output of the analog variable gain amplifier; and

a gain controller adapted to measure a signal output ~~from the digital variable gain amplifier strength~~ and to control the gains of the analog and digital variable gain amplifiers. ;  
and

a DC offset canceller interposed between the output of the analog variable gain amplifier and an input of the digital variable gain amplifier, wherein the gain between the output of the analog variable gain amplifier and the input of the digital variable gain amplifier is essentially constant.

2. (Currently Amended) ~~The apparatus of claim 1, further comprising:~~

An automatic gain control (AGC) apparatus operable during direct conversion of RF signals comprising:

an analog variable gain amplifier;

a digital variable gain amplifier coupled to an output of the analog variable gain amplifier;

a gain controller adapted to measure a signal strength and to control the gains of the analog and digital variable gain amplifiers; and

a DC offset canceller interposed between the output of the analog variable gain amplifier and an input of the digital variable gain amplifier, wherein an AGC loop gain is varied according to an operating mode of the DC offset canceller.

## PATENT

3. (Currently Amended) A method of operating an automatic gain control (AGC) loop in combination with a DC loop, ~~during direct conversion of RF signals~~, comprising:
- selecting a particular DC operating mode for the DC loop from among a plurality of possible DC operating modes;
  - operating the DC loop in the selected DC operating mode to correct for DC offset in a ~~desired~~ signal;
  - selecting a particular AGC operating mode for the AGC loop from among a plurality of possible AGC operating modes based on the selected DC operating mode; and
  - operating the AGC loop in the selected AGC operating mode to provide variable gain for the ~~desired~~ signal.
4. (Original) The method of claim 3, wherein the plurality of possible DC operating modes include an acquisition mode and a tracking mode.
5. (Currently Amended) The method of claim 4, wherein the acquisition mode has a wider loop bandwidth than that of the tracking mode and is used to more quickly remove a large DC offset in the ~~desired~~ signal.
6. (Original) The method of claim 3, wherein each of the plurality of possible AGC operating modes is associated with a respective AGC loop gain.
7. (Original) The method of claim 3, wherein the plurality of possible AGC operating modes includes a normal mode and a low gain mode.
8. (Original) The method of claim 7, wherein the plurality of possible AGC operating modes further include a freeze mode.
9. (Original) The method of claim 4, wherein the selected AGC operating mode is a low gain mode when the selected DC operating mode is the acquisition mode.

## PATENT

10. (Original) The method of claim 4, wherein the selected AGC operating mode is a freeze mode when the selected DC operating mode is the acquisition mode.

11. (Currently Amended) A direct conversion receiver unit in a wireless communication system, comprising:

a DC loop configurable to operate in one of a plurality of possible DC operating modes to correct for DC offset in a ~~desired~~ signal; and

an automatic gain control (AGC) loop configurable to operate in one of a plurality of possible AGC operating modes to provide variable gain for the ~~desired~~ signal, wherein the particular AGC operating mode to be used is determined based on the particular DC operating mode selected for use for the DC loop.

12. (Currently Amended) A control apparatus adapted for use in a direct conversion receiver, comprising:

means for selecting a particular DC operating mode for a DC loop from among a plurality of possible DC operating modes;

means for operating the DC loop in the selected DC operating mode to correct for DC offset in a ~~desired~~ signal;

means for selecting a particular AGC operating mode for an automatic gain control (AGC) loop from among a plurality of possible AGC operating modes based on the selected DC operating mode; and

means for operating the AGC loop in the selected AGC operating mode to provide variable gain for the ~~desired~~ signal.

13. (Cancel)

14. (Cancel)

15. (Previously Amended) A method of operating a DC loop in a receiver unit, comprising:

## PATENT

selecting a particular operating mode for the DC loop from among a plurality of possible operating modes that include an acquisition mode; and

if the selected operating mode is the acquisition mode,

operating the DC loop in the acquisition mode for a particular time duration to correct for DC offset in a desired signal, wherein the particular time duration is inversely proportional to a loop bandwidth for the DC loop for the acquisition mode, and

transitioning out of the acquisition mode after the particular time duration,

the acquisition mode being selected in response to an event expected to result in a large DC offset in the desired signal, where the event corresponds to a switch to new analog circuit stages to process the desired signal.

16. (Previously Amended) A method of operating a DC loop in a receiver unit, comprising:

selecting a particular operating mode for the DC loop from among a plurality of possible operating modes that include an acquisition mode; and

if the selected operating mode is the acquisition mode,

operating the DC loop in the acquisition mode for a particular time duration to correct for DC offset in a desired signal, wherein the particular time duration is inversely proportional to a loop bandwidth for the DC loop for the acquisition mode, and

transitioning out of the acquisition mode after the particular time duration,

the acquisition mode being selected in response to an event expected to result in a large DC offset in the desired signal, where the event corresponds to application of a new DC offset value to correct for static DC offset in the desired signal.

17. (Cancel)

18. (Previously Amended) A method of operating a DC loop in a receiver unit, comprising:

selecting a particular operating mode for the DC loop from among a plurality of possible operating modes including at least an acquisition mode and a tracking mode; and

**PATENT**

if the selected operating mode is the acquisition mode,  
operating the DC loop in the acquisition mode for a particular time duration to correct for DC offset in a desired signal, wherein the particular time duration is inversely proportional to a loop bandwidth for the DC loop for the acquisition mode, and  
transitioning out of the acquisition mode after the particular time duration, the transition being made from the acquisition mode to the tracking mode after the particular time duration.

19. (Cancel)
20. (Cancel)
21. (Cancel)
22. (Cancel)
23. (Cancel)
24. (Cancel)
25. (Cancel)
26. (Cancel)
27. (Previously Cancelled)
28. (Previously Cancelled)
29. (Previously Cancelled)
30. (Previously Cancelled)

**PATENT**

31. (Previously Cancelled)

32. (Previously Cancelled)

33. (Previously Cancelled)

34. (Previously Cancelled)

35. (Previously Cancelled)

36. (Previously Cancelled)

37. (Previously Cancelled)

38. (Previously Cancelled)

39. (Previously Cancelled)

40. (Previously Cancelled)

41. (Previously Cancelled)

42. (Previously Cancelled)

43. (Previously Cancelled)

44. (Previously Cancelled)

45. (Previously Cancelled)

Attorney Docket No.: 010161

Customer No.: 23696

**PATENT**

46. (Previously Cancelled)

Attorney Docket No.: 010161  
Customer No.: 23696